

REMARKS

Applicants respectfully request reconsideration of the present application in view of the foregoing amendments and in view of the reasons that follow. After amending the claims as set forth above, claims 14-30 are now pending in this application.

Applicants wish to thank the Examiner for the careful consideration given to the claims.

Prior art rejections

Claims 1-13 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 4,443,318 (“McKelvey”), U.S. Patent 5,725,746 (“Dickey”), and U.S. Patent 5,200,049 (“Stevenson”). Claims 1-13 have been canceled, which renders the rejections of these claims moot. For at least these reasons, favorable reconsideration of the rejections is respectfully requested.

Allowability of claims 14-30

Claim 14 recites, among other things, a target assembly comprising: a rotatable target tube; and a central body. The central body comprises interior to said tube: a bearing system for rotatably supporting said tube by said body, at least one rotatable coolant seal for supplying coolant to or extracting coolant from said tube through said body, and at least one rotatable vacuum seal for enabling a vacuum outside said tube. None of McKelvey, Dickey, and Stevenson teaches or suggests this combination of features.

For example, McKelvey fails to disclose a bearing system interior to said tube for rotatably supporting said tube by said body. Indeed, the trunnion 38 of McKelvey supports the body in the tube, i.e., the other way around of what is required in claim 14. (See Fig. 1 of McKelvey.) As the coolant conduit 36 of McKelvey is not stiff enough, it must be supported at its end by the trunnion 38, but the trunnion 38 does not support the tube. The trunnion 25 held by the bracket 26 carries the tube and these are located outside the tube. (Column 2, lines 39-44 of McKelvey.)

McKelvey fails to disclose a rotatable coolant seal interior to said tube. The inner end wall 23 of McKelvey rotates in its entirety together with the tube, but this is quite different from a seal that physically separates a gas containing space from a coolant containing space

while enabling a rotary movement between both spaces. (See page 3, lines 31-33 of the specification.)

McKelvey fails to disclose at least one rotatable vacuum seal interior to said tube. McKelvey does teach sealing collars 28 and 29 but these collars are outside the tube. (Fig. 1 and column 2, lines 44-46 of McKelvey.)

Because McKelvey does not teach or suggest a central body comprising interior to said tube: a bearing system for rotatably supporting said tube by said body, at least one rotatable coolant seal for supplying coolant to or extracting coolant from said tube through said body, and at least one rotatable vacuum seal for enabling a vacuum outside said tube, claim 14 is allowable over McKelvey.

Dickey fails to disclose a bearing system interior to said tube for rotatably supporting said tube by said body. The bearing 178 of Dickey is identified to be used for the cooling water input tube 130. (Column 8, lines 29-46 of Dickey.) The bearing 178 is intended to be a bearing for supporting the tube 130 through the plug 162 in the tubular member 144. (Column 8, lines 40-45 of Dickey.) Thus, the body is carried by the target tube, not the target tube by the body as required by claim 14.

Dickey fails to disclose a rotatable coolant seal interior to said tube. The plugs 162 and 160 are for sealing the target tube at the ends. These plugs remain fixed relative to the tube but this is quite different from a seal that physically separates a gas containing space from a coolant containing space while enabling a rotary movement between both spaces. (See page 3, lines 31-33 of the specification.)

Because Dickey does not teach or suggest a central body comprising interior to said tube: a bearing system for rotatably supporting said tube by said body and at least one rotatable coolant seal for supplying coolant to or extracting coolant from said tube through said body, claim 14 is allowable over Dickey.

Stevenson fails to disclose a bearing system interior to said tube for rotatably supporting said tube by said body. Stevenson provides that the “[d]rive shaft 48 is rotatably mounted in bearing housing 32 by bearings 52, 54 and 60.” (Column 4, lines 40-41 of Stevenson.) Thus, the bearings 52, 54 and 60 are inside the bearing house – which is stationary - and not inside the cathode body 21 of Stevenson (i.e., the target tube). (Fig. 1 of Stevenson.) Also, Stevenson discloses that “[s]pecifically, the entire load of the magnetron is

supported by the bearings." (Column 4, lines 53-55 of Stevenson.) Hence, these bearings support the target tube. The bearings 82 and 130 are internal to the target tube but support the cooling liquid input tube 80 not the target tube. (Column 5, lines 59-61 of Stevenson.) It is clear that the bearing system for supporting the tube is outside the target tube, contrary to claim 14.

Stevenson fails to disclose at least one rotatable vacuum seal interior to said tube. The plug 70 and O-ring seals 71 and 73 are not rotatable vacuum seals but they are static with respect to target tube they are mounted on. Also, the rotary vacuum seal 50 of Stevenson is situated clearly outside the target tube 21, namely in the stationary bearing housing. (Fig. 1 of Stevenson.)

Stevenson fails to disclose a rotatable coolant seal interior to said tube. The (single) rotatable coolant seal 98 in Stevenson and is clearly situated outside the target tube 21. (Fig. 1 of Stevenson.)

Because Stevenson does not teach or suggest a central body comprising interior to said tube: a bearing system for rotatably supporting said tube by said body, at least one rotatable coolant seal for supplying coolant to or extracting coolant from said tube through said body, and at least one rotatable vacuum seal for enabling a vacuum outside said tube, claim 14 is allowable over Stevenson.

Claim 23 recites, among other things, a target assembly comprising: a rotatable target tube; a first central body; and a second central body. The first and second central bodies comprise interior to said tube: a bearing system for rotatably supporting said tube by said first body or said second body, at least one rotatable coolant seal for supplying coolant to or extracting coolant from said tube through said first body or said second body, and at least one rotatable vacuum seal for enabling a vacuum outside said tube. None of McKelvey, Dickey, and Stevenson teaches or suggests this combination of features.

As previously mentioned and analogous to the analysis of claim 14, McKelvey does not teach or suggest the claimed bearing system, the claimed rotatable coolant seal, and the claimed rotatable vacuum seal in the interior of said tube. Thus, claim 23 is allowable over McKelvey.

As previously mentioned and analogous to the analysis of claim 14, Dickey does not teach or suggest the claimed bearing system and the claimed rotatable coolant seal in the interior of said tube. Thus, claim 23 is allowable over Dickey.

As previously mentioned and analogous to the analysis of claim 14, Stevenson does not teach or suggest the claimed bearing system, the claimed rotatable coolant seal, and the claimed rotatable vacuum seal in the interior of said tube. Thus, claim 23 is allowable over Stevenson.

Claims 15-22 and 24-30 depend from and contain all the features of claim 14 or 23, and are allowable for the reasons indicated above, without regard to the further patentable features contained therein. However, the following is noted.

Dickey does not teach the features of claims 15 and 24 because Dickey discloses that electrical power is introduced to the magnetron through “a brush contact within block 114 by way of a drive spindle 170.” (Column 8, lines 37-40 of Dickey.) Hence, the rotatable electrical contact is within block 114, i.e., not inside the tube as requested by claims 15 and 24.

Dickey does not teach the features of claims 16 and 25 because the drive spindle 170 in Fig. 4 is for transferring electric power not for making the target tube rotate. The target tube is rotated through the action of the motor 118, gear box 122, and shaft 124 in end block 116 which is opposite to the end-block 114 for transferring electrical power. The drive means – i.e. the motor 118 – is clearly situated outside the target tube.

Stevenson does not teach the features of claim 15 because the electrical contact to the target tube in Stevenson is established through a brush contact 112 which is outside the target tube. (Column 5, lines 31-36 of Stevenson.)

Stevenson does not teach the features of claim 16 because the motor 106 is clearly outside the target tube.

For at least these reasons, allowance of claims 14-30 is respectfully requested.

Conclusion

Applicants believe that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing or a credit card payment form being unsigned, providing incorrect information resulting in a rejected credit card transaction, or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicants hereby petition for such extension under 37 C.F.R. §1.136 and authorize payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

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